

Aboriginal people and granite domes

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Abstract

Granite domes provided Aboriginal people living on the surrounding plains with a variety of economic products. Granite domes also acted as focal points for the activities of ancestral heroes who journeyed throughout the landscape. Aboriginal religious practice includes ritual dramas which replicate the activities of these ancestral heroes at such sites. Surface geology therefore determines both the economic practices and religious activities undertaken by Aboriginal people within their territories.

Introduction

Granite domes are prominent landscape features common to a large part of the southern central region of Western Australia, although they do occur in other places throughout the State. We can reasonably assume that granite domes have played important roles in the settlement and continued occupation of Western Australia since humans first arrived in the area, possibly some 125,000 years ago (Science, Oct 4, 274: 33-34; West Australian, Nov 16, 1996, 34). Not least in importance was the role that granite domes played in providing water in the arid interior, a function which continues to be crucial for many Western Australian towns (Simpson 1926). Use of waters collected on rock exposures allowed grazing in Western Australian shrublands which could not be reasonably exploited until subterranean water could be used (Dimer 1989). Much of the exploration of the State was accomplished by survey teams locating waters or persuading or coercing Aboriginal people to reveal water sources found on or adjacent to granite domes. For Aboriginal people, *inselbergs* provided or facilitated access to a wide range of resources other than water, but water was and remains crucial to human occupation of much of Western Australia.

Water Supplies

Physical composition and shape of granite domes determine their water-yielding capacity. Weathered surfaces with water-holding depressions of one shape or another are common to most granite exposures. One form of natural reservoir called a 'gnamma hole' contributes its Aboriginal name to Australian English. The common addition of the English 'hole' to this phrase is redundant as explained below. Gnammas are commonly found in granites, but these kinds of holes also form in lateritic and quartz arenite mesas.

Kavanagh (1984) limits his definition of gnammas to holes formed in granites and given the name '*gnamma*'

by desert dwelling Aboriginal people. The word '*gnamma*' originates further to the west than Kavanagh's usage suggests. According to Wilkes (1978:227) who compiled a dictionary of Australian colloquialisms, the first published usage of the term is by George Fletcher Moore. In his '*Descriptive Vocabulary*' of Aboriginal words from the South-west of Western Australia, Moore (1842) lists '*amar*' and '*gnamar*' as meaning "hole or pool of water in a rock." Although we are not told which dialect this word is from, we can assume from other entries in Moore's lists that the word was applied in the south-west where Nyoongar people live and also perhaps a little further eastwards in the Goldfields (Bindon & Chadwick 1992).

Although the origin and development of gnammas is not known with absolute certainty, they are believed to be formed primarily by chemical weathering of less well consolidated portions of the rock (Campbell & Twidale 1995). Talbot, a geologist employed by the Western Australian Government in the early part of this century, separated gnammas into two types of holes capable of holding water (Talbot 1912). Elongated ones, which he thought probably developed along cracks and sheet joints formed his first group, and rounded ones, where globular feldspathic crystalline masses were eroded by carbonic acid produced by decomposition of vegetable matter trapped in an initial depression, made up his second group. Talbot believed that the activity of animals scratching for moisture as well as human excavation contributed to the development of gnammas. He based his conclusion on having observed soft decayed granite two centimetres thick lining a hole which he cleaned out at Day's Rock. This soft material could be removed from the surface with a shovel, but beneath this soft layer the rock was quite solid (Talbot 1912:39). We are given no estimation of how long it may have taken for this weakened material to form! The geologist Woodward thought gnammas formed through the rapid disintegration of certain coarsely crystalline pegmatite bunches in the granite, which had segregated out in the original processes of cooling of the molten mass. He says "...for it is in this class of rock [granites] that the "gnamma" holes occur, upon which in the past the aborigines [sic] and also many white explorers have had to rely for their water supply" (Woodward 1912:16).

Gnammas can vary in depth from a few centimetres

to 10 metres with a diameter up to two metres (Serventy 1973). Maintenance of these holes to maximise water retention and control quality was an important Aboriginal activity wherever the small reservoirs occurred. Mountford observed that "The Aborigines often cover these small but invaluable supplies, *nama*, with slabs of stone to minimise evaporation and prevent contamination by the creatures" (Mountford, 1976:42). Gnammas were considered important enough by European Australians to be marked on cadastral and geological maps until very recently.

During the Elder expedition through then unmapped south-eastern parts of the state, Helms made a number of observations concerning Aboriginal use of gnammas. He says "The rock-holes seem to be a special characteristic of this portion of Australia, and without them it would be impossible for the natives to exist. They are mostly found in granite, a softer mass or nodule having weathered away, thus forming natural cisterns of various shapes and dimensions. Some of them will hold many thousand gallons when filled, and as the water cannot escape by percolation the supply will last for a long time. To prevent animals getting at the water, most of the rock-holes are partly or entirely filled with loosely lying sticks, which practice, necessary as it may be to save the water, deteriorates its quality considerably by making it often look quite black and giving it a fetid smell and taste" (Helms 1892:253).

Helms' observation was repeated or perhaps copied by the ethnographer Daisy Bates who says "Rock holes are found in granite hills, either at the foot of hills or on a slope, or even on the top of some of the hills. To prevent animals, birds etc., from getting at these holes, the natives sometimes fill them with sticks or branches, which not infrequently spoil the water, or give it a fetid taste, and smell" (Bates 1985: 263). Aboriginal people have indicated to me that the sticks allow animals to reach the water, drink and climb out of the hole without being stranded and dying by drowning. The sticks thus prevent contamination by animal carcasses.

Kavanagh examined water supplies in arid Australia from the perspective of their use in defence (Kavanagh 1984). His assessment of gnammas was that they are generally ephemeral, lasting for just a few months depending on the rate of evaporation and exploitation. He did not think that they were useful for defence purposes. His attitude demonstrates the difference between the understanding of arid land exploitation patterns held by desert dwellers and those of itinerant desert visitors. Aboriginal people generally first used ephemeral water resources which disappear most rapidly. Claypans and other playa lakes that have great surface areas and little depth diminish quickly through evaporation. Following observation of storms in particular areas, people moved to the recently watered area. There they exploited whatever food resources they could while awaiting game attracted by new growth, and the flowers and fruits that follow a month or more after the storm passes. During their wait, they used the water in the claypans for their daily needs. As these resources diminished, the group would move back to more reliable water sources, perhaps well-shaded deep rock pools in narrow rocky valleys. Being well acquainted with the probabilities of the climate

and knowing intimately all the water storages of their region, their actions and movement to new water sources were always carefully thought out with all likely possibilities considered. When the group did decide to move, their course would often involve travelling between a series of granite domes, which then became not only resource bases, but also navigational markers.

Daisy Bates emphasised the importance of knowing the exact location of these life-sustaining landscape features. The necessity for having great familiarity with the resources of the land was a lesson only learnt following great hardship by many European explorers of Australia. She said "What are called 'ngamma holes' are circular hollows in a sandstone formation found principally in the Eucla division, and east of the Coolgardie goldfields district. Every ngamma hole in his district is known to the native. Many of these holes contain hundreds of gallons of water, the quantity varying with the size of the hole" (Bates 1985: 264). Bates goes on to describe how water holes occur at certain intervals across the Great Australian Bight. These waters would have allowed Eyre to traverse this region much more comfortably if he, and his Aboriginal guides, had the knowledge of their location held by those who were familiar with the countryside.

A few European explorers who learned the hard way did not survive to pass on their wisdom (Maclaren 1912). Austin, who did survive, explored the State's Ashburton and Gascoyne regions and recognised the importance of gnammas. He recorded in his journal the following observations; [country] "...watered by holes in a granite rock, we depended on the precarious supply of rainwater accumulated in the hollows of the rocks, finding plenty of water here in the hollows of the rocks" (Austin 1856:236-239). His journey was possible because he and his party located these small water-holes. Until artesian sources were tapped, these uncertain resources provided the only surface water besides that flowing in the intermittent rivers following unpredictable rains. At one stage, Austin was warned by Aboriginal people not to enter the upper Murchison-Gascoyne districts except in the winter, because there was no water available except at that time.

Hunting and Gathering Sites

The run-off that provided surface water in gnammas, also permitted other forms of life to flourish on, but mainly around the base of, the inselbergs. This is not to deny the significance of the various plants and animals colonising the rock surface itself, but few of these were important for Aboriginal people except through the contribution they made to the life of the higher plants and larger animals usually hunted as game. Various plant species favoured the rim of rocky outcrops, exploiting the zone where run-off from the all too rare rainfall was concentrated. Two very important trees to arid land dwellers, Kurrajongs (*Brachychiton gregorii* F Muell) and Quandongs (*Santalum acuminatum* (R Br) D C) are commonly found around granite outcrops. They provide fruit, wood and sometimes medicinal products for Aboriginal people, but also attract emus and other bird-life. The

medicinally important Rock Isotome, (*Isotoma petraea* F Muell) and the Adjikoh or Warrain (*Dioscorea hastifolia* Endl in Lehm), a staple yam species, also favour granite outcrops. If for no other reason, Aboriginal people visited granite domes to exploit these resources. The occurrence of food plants and water also attracted animals such as macropods and reptiles, many of which also contributed to Aboriginal diet.

Austin observed "In many places about the country, and particularly near some of the rocks, brushwood fences are found that serve, or have served, the purpose of trapping game. These fences are about two feet high, and simply made of broken-down shrubs and branches of trees, mainly mulga, and converge to an angle after extending for a long distance over the ground" (Austin 1856:256). At the end of the fence or at the convergence of two of these, holes were dug into which fell any animals that followed the fences to a gap. In other cases nets were suspended to ensnare animals which traversed the fences to the narrowing funnel. Austin goes on to say, "Near the rocks I have seen them constructed in a zig-zag shape, with the self-acting trap at the apex of the angles furthest away from the rocks" (Austin 1856:256).

On a number of granite outcrops in the south-west, features called 'lizard traps' can be found. These take the form of a rock plate or slab up to about a metre in diameter that is propped up along one edge by a number of other rocks so that it lies at a slant. As there is no possibility of the top rock falling and holding the lizard, we can assume that these were not true traps. However, they may be purposefully built especially to encourage sustained lizard populations on selected rock exposures by providing protective habitats. One presumes that establishing environments like this ensured the visiting hunter of a supply of animals on recurrent visits. It has been observed that when disturbed away from cover on these rock exposures, and given an opportunity, lizards or any small game run directly to the dark shelter of these slanted rocks. Regrettably, there is no evidence from ethnography confirming the function of these rock structures. However, their existence provides more than a suggestion that an early form of animal husbandry may have been in operation on these granites.

During a trip by car between Perth and Albany, a now deceased Aboriginal man from the Great Southern region observed that the areas around some of the granite exposures we passed needed burning to 'clean them up'. He said that traditionally it was permissible to burn around granites quite regularly because the exposed rocks provided a refuge for animals living nearby that fled to the vegetation free area during the burn. He also observed that there was always a piece of adjoining bushland that did not burn because of the topography of the granites, so homeless animals could easily re-establish themselves. There is no easy way of verifying for how long such beliefs about the management of the environment surrounding granite domes have been held by Aboriginal people. Clearly, however, my passenger's understanding of the processes involved with managing the resources available in these environments was quite extensive.

Places Frequented by Heroic Ancestral Figures

Since all the members of any Aboriginal linguistic group claim to be a descendant of one or another of the ancestral beings, and since the people are living in the landscape created by these ancestors, it follows that every person is linked by their lineage to the landforms, to other living things in the same environment, and to the associated mythology. These various links dominate and to a great extent determine the actions of any individual. Mountford points out in relation to art "that, as the Aborigines' love for their country is so deep, and the myths that tell of its creation so strongly determine their lives and behaviour, these beliefs should be reflected in their art, about which little was known" (1976:55). Mountford's argument can be applied with equal weight to many other activities including songs, stories, ritual dramas and the like.

Having recognised that Aboriginal beliefs about the countryside are related to activities undertaken within that landscape by heroic ancestral figures, we can briefly examine the implications of these tenets. By re-enacting the activities of their ancestors during commemorative ceremonies, Aboriginal people re-affirm and reinforce their religious beliefs. Amongst the activities which ancestors first performed, and which modern Aboriginal groups often maintain, is the creative formative journey first taken by the ancestor figure during the establishment of the present landscape. These ancestral journeys began so long ago that they now possess the qualities of dreams. In affirming their veracity, Aboriginal people use mime, song and dance which bring the totemic ancestors to life before their human worshippers (Strehlow 1971:349). Thus, the activities of ancestral beings around granite domes which occurred during the *tjukurrpa* (Dreaming) are mirrored by the actions of the most recent Aboriginal groups.

Numbers of granite domes were used as ceremonial areas by Aboriginal people. This is partly due to the significance these places receive from being associated with ancestral figures, but there are many other reasons why particular sites were chosen as a focus of ceremonial activity. Stone arrangements often mark these ritual places. The constructions, formed from slabs and other weathering products from the inselbergs, take the form of a 'W', are erected as a sinuous line or may be piled into a series of scattered mounds. Although the particular ceremonies carried out at these places cannot be detailed, it can be assumed that these features represent aspects of landscape and are connected with initiation procedures. As a mark of respect to their Aboriginal custodians, such places should be avoided if they are encountered, and care should be taken that they are not disturbed. Their location should be reported to the appropriate authority (AAD, Western Australian Government, 1982).

Art Sites

Numbers of granite domes scattered around Western Australia and in other parts of the continent contain extensive galleries of Aboriginal art. The motifs may be recognisable but the themes are often arcane (Mountford 1976). Some regions, such as the Pilbara, have art that

seemingly has no relationship in motif or theme to any other Australian Aboriginal artistic province (Wright 1968). In this part of the state, painted art forms are comparatively rare. The various motifs are usually produced by hammering, battering or pecking away the dark patinated surface from the rock to expose the lighter coloured fresh inner core. The anthropomorphic figures produced by this method, are enigmatic in form, lyrical and dynamic in execution. They are evocative of an intense and complex motivation underlying their execution. Despite many years of study, their ultimate meaning remains elusive. However, it is possible that these human-like forms represent the larger-than-life capacities of ancestral heroes.

Just south of the Kimberley region, at the northern extent of the bloc of Aboriginal cultures belonging to the western desert, a very different art genre exists. Here, circular forms composed of a number of concentric rings are joined into larger compositions using one or more parallel straight or sinuous lines. These forms seem related to the well-known art style of central Australia that depicts features in the landscape as a series of concentric circles with paths between them depicted as lines. It is difficult to avoid the idea that these motifs sometimes represent or at least include the very location at which they are found, linking that place with other localities visited by some ancestor or another. Unlike the Pilbara art, which might represent the ancestors themselves, this art represents their journeys through the landscape. Such an interpretation was provided to me by a group of Aboriginal men who were explaining motifs painted on the waiting room walls at Wirrimanu airport (Balgo Hills).

It is not surprising that ancestral figures are believed to have visited the very localities that their modern heirs visit. The human aspect of ancestral behaviour means that these ancients too must hunt to eat, must drink, and in fact perform all the acts that are necessary for life. Dominating the otherwise level plains of much of inland Australia, granite domes not only form prominent navigational pointers and ritual centres, they also supply many of the daily needs of humans just as they are believed to have done for ancestral heroes.

Quarries

Very few portable Aboriginal stone artefacts have been found that are made of granite. The crystalline nature of this rock type makes it an unsuitable material from which to shape tools by flaking. However, some ground objects made from granite, including a few fist-sized pebbles used as hammers or millstones are in the archaeology collections of the Western Australian Museum. Large grinding plates of granite are also found, especially where seed-grinding contributed significantly to Aboriginal diet. Invariably, these granite grinding bases are made on an exfoliated plate-like piece of suitable size. Fissuring and thermoclastic weathering of the surface of granite batholiths results in the scalar detachment of successive layers of roughly circular rock plates that slide down the convex face and stack or heap as a talus at the foot of the slope. Aboriginal people most likely utilised these found

objects because there is no physical evidence on batholiths or on the grinding plates that they were detached from the parent body using artificial means. Around the base of granite domes, on the gently sloping aprons, areas used for seed grinding can often be seen. These consist of a polished or smoothed surface, about 40 x by 20 cm, with a central depression one or two centimetres deep. A variety of seeds collected on the surrounding plain from grasses, shrubs and trees was ground to flour or gruel in these depressions using a fist-sized millstone. There may well have been other uses of granite domes more ephemeral than this, but evidence is lacking for these.

Although structures interpreted as hunting hides or perhaps the walls of semi-permanent shelters can be found on the surfaces or in the surrounding scree slopes of granite domes in the north of Western Australia, these constructions cannot be considered as typical of Aboriginal activities on granite domes. Using loose tabular pieces from weathering processes, windbreaks can be made fairly quickly, particularly if some brushwood is incorporated into the structure. Lack of archaeological remains other than the walls in these structures hinders their exact interpretation, and the interpretations provided here reflect modern Aboriginal people's comments on the structures.

Temporal Perspectives on Aboriginal Use of Granite Domes

Aboriginal use of granite domes probably extends much farther back in time than archaeological investigations suggest. The concentration of resources available near these impressive landscape features was clearly of great importance to Aboriginal people, who may or may not have left physical evidence of their visits to the sites. As we have seen, one obvious indication of Aboriginal use is the occurrence of seed grinding bases that are specially common around the aprons of granite domes. Although certain mineralised depositions may be found in these grinding bases, there is still no satisfactory method for obtaining their age. Portable seed grinding bases made of granite slabs are sometimes found in dateable contexts within archaeological excavations, but their occurrence does little more than indicate that seed grinding is an ancient activity, and does not really elucidate usage of granite domes. Despite this general lack of information, some archaeological excavations have revealed a short chronology of Aboriginal people's interest in granite domes.

Walga Rock

The inselberg known as Walganna or Walga Rock, located about 60 km east of Cue, is some 1.5 km long and 500 m wide. It emerges from a very flat semi-arid landscape clothed with dispersed Mulga (*Acacia aneura*) woodland. Situated adjacent to a temporary water hole, a shallow west-facing shelter runs for more than a hundred metres on the south-west side. This shelter developed along sheet joints; the highest and deepest part evolving through haloclasticism as well as thermoclastically. The rear wall of the rock shelter is decorated with paintings in red, yellow and white pigments (Bindon *et al.*, unpublished).

A stratigraphic sequence established in the excavation of six square metres which reached about 3 metres in depth revealed three distinct sedimentary units. The upper unit is strongly evident of human activity and disturbed by numerous burrows. Two dates obtained from the lower part of this unit show that it covers the last millennium bp; Ly 2098 is $1\ 040 \pm 180$ bp and Ly 2087 is 790 ± 160 bp. Below this, and in-filled between the lower series and the back wall of the shelter lies the middle unit. One date relates to a median layer of this complex; Ly 2099 is $3\ 820 \pm 200$ bp. The lowest unit, the upper part of which trends toward the shelter, producing the internal segment of a complex cone of debris has two dates for a central zone; Ly 1847 is $9\ 950 \pm 750$ bp and Ly 1846 is $7\ 010 \pm 350$ bp.

Sediment analysis revealed that firstly a mass movement of sediments occurred, which, in conjunction with mobilised granitic sand, covered the flanking embayments and superficial slab of the batholith by around 10 000 bp. The summit of this depositional event is marked by a discrete zone of small thermoclastically produced platelets. This is evidence for a wet phase followed by a drier period. Between about 7 000 and 4 000 bp, a series of hydrological events took place that caused in-cutting and furrowing into the back portion of the sloping bank formed by the first deposits. Erosional unconformities confirmed that periods of climatic variation occurred, during which deposition and subsequent erosion of a number of separate sediments alternated. Around 3 820 bp, the deposition of the upper friable unit began. Its sub-horizontal arrangement, and feeble development indicate a marked decrease in detrital deposition and relative climatic homogeneity that continued to about 690 bp.

Evidence of human use of the shelter was found throughout the whole of the excavation sequence, giving us indications of human activity in the vicinity for the last 10 000 years. Occupation was intermittent and more or less in the same temporal pattern as delineated by other authors writing about arid inland Australia (Gould 1977; Smith 1988; Veth 1989). Periods of sparse use begin the sequence, followed by a gradual increase in visitation that culminates in an intensive occupation over the last few thousand years. At around 4 000 years ago, small delicately flaked stone tools begin to appear here just as they do around this time in many other Australian archaeological sites. A similar temporal sequence was discovered in another shelter in a granite dome close to the south coast.

Cheetup

Smith (1993) excavated a shelter, Cheetup, about five kilometres from the present shoreline in the Cape Le Grand National Park. This north-east facing shelter is situated on the top and northern end of a granite dome, with a commanding view over the surrounding plain. Protection is provided from cold winds and storms originating from the south and west. There is easy access to a mixture of vegetation zones that include heathlands dominated by the Proteaceae, thickets of Myrtaceae and several swamps. Excavations in the shelter revealed a complex but shallow stratigraphy about 60 cm in depth. Ten radiometric dates bracket various sedimentary events which extend beyond $13\ 245 \pm 315$ bp (GX 6605).

Before this date, a pit was dug in the shelter floor. It was lined with *Xanthorrhoea* leaf bases and woody parts and filled with fruits of *Macrozamia reidlii* (Gaud) CA Gard. This particularly interesting discovery confirms ethno-historic descriptions of a food preparation technique made by early European settlers in the district. Toxins in *Macrozamia* fruits must be removed by leaching or fermenting and cooking before the fruits are rendered edible. Smith's (1993) discovery of this fermentation pit demonstrates that Aboriginal usage of this plant extends back almost 14 000 years into prehistoric times. Faunal and botanical remains recovered from the excavation point to a more or less stable ecosystem on the granite regardless of what occurred on the surrounding heathlands.

Recherche Archipelago

At the height of the last global glacial maximum around 18 000 bp, islands now forming the Recherche Archipelago were granite peaks in an extended coastal plain. This plain was some 60 km wide if we consider the coast to be located near the edge of the continental shelf at that time. Like mainland granite exposures, the islands have areas of shallow sands, soil and granite debris.

Dortch & Morse (1984) located ten open sites and 30 isolated artefacts on five of the Recherche Archipelago Islands. No shelters that could be occupied with comfort were found by them. During two visits to the Recherche Group, I also was unable to locate any shelters that showed evidence of extended human occupation. Seven of Dortch and Morse's sites are on Middle Island, one on Gulch Island, and two on Stanley Island. Basing their estimations on present-day water depths surrounding the islands, they considered that Middle Island was formed between about 11 000 and 9 000 years ago, with the smaller Stanley and Gulch Islands separating from the mainland 1 000 to 2 000 years later.

The ten island sites consist of scatters of between 14 and 99 stone artefacts. Apart from an infilled rockhole on Flinders Peak, Middle Island, from which 14 artefacts were retrieved, no stratified prehistoric archaeological features were discovered. Smith (1993) argued that the stone objects were discarded when the localities were the peaks of granite domes whose bases have subsequently been inundated. However, information about prehistoric aspect, vegetation association, access to resource zones, and distance to freshwater, are almost impossible to determine for these sites. Although most island sites are within 200 m of the present shoreline, this distribution pattern be partly a function of the elevation of the batholith above present sea levels and area of the exposure of the outcrop as well as factors relating to ground visibility. Obviously, with the coastline so distant for most of the time that the peaks seem to have been used, no suggestion is being made that these sites indicate some type of exploitation of the littoral.

Although there is not enough evidence to decide with any certainty what criteria were used by Aboriginal people to determine the location of these sites they offer evidence of a low intensity of usage during the time when the surrounding plains were occupied by Aboriginal hunters and gatherers. However, Smith (1993) argues that the sites on the islands represent a land use system that continued on post-transgressive mainland sites. She

bases this argument on the occurrence of scattered sites around granite domes on the mainland that contain the same kinds of stone artefacts as those found on the islands.

There is also some indication of Aboriginal presence on the islands during the post-contact period. Some assemblages contain Aboriginal artefacts made of European materials, for example china. These are assumed to be "linked with the presence of European and American sealers, who seem to have had with them Tasmanian women and other Aboriginal people" (Dortch & Morse 1984:34). One of the Stanley Island assemblages includes a tula adze of coastal chert. Tula adzes, hafted in the end of spearthrowers, continued in use until the mid twentieth century in areas to the north east of the study area, and along the coast towards South Australia. Local Aboriginal people claim to have visited these islands during the first half of the twentieth century specifically to exploit nesting birds, mainly mutton-birds and shearwaters that have rookeries on the islands. It is not unlikely that this adze may have been discarded either during the whaling and sealing period of the early nineteenth century or even more recently during raids on bird rookeries. The occurrence of Aboriginal objects manufactured from European materials indicates that, whether willingly or not, Aboriginal people continued their association with these off-shore sites. Following inundation of the surrounding plains, a hiatus imposed by lack of watercraft precluded access until relatively recently.

An Earlier Occupation?

Following the identification of tools manufactured from bones derived from extinct megafauna found in sediments cleared early this century from depressions in granite domes in the Balladonia district, I proposed in conjunction with several other authors based in the Western Australian Museum that Aboriginals had inhabited the region perhaps fifty thousand years ago (Western Australian Museum Palaeontology Dept registration numbers; 65.2.80, 79.11.1, 79.11.5, 79.11.6 and 79.11.10). This proposition was based on the presumed date of the final disappearance of certain species of megafauna. Bone tools are difficult objects for archaeologists to identify because the taphonomy of the archaeological material in a site is not always unequivocal. Lacking conclusive dating we have not pressed this claim. However, detractors have not been able to completely demolish our case. What our study did help to emphasise was the importance of granite domes to both Aboriginal people and European settlers in the region. The latter group enhanced the meagre supplies these natural depressions provided by removing calcretised infills with explosives to increase water holding capacity. While their activities produced the sample of fossil bone material, it destroyed all stratigraphic context.

Conclusions

Aboriginal people used granite domes and their surrounds for a wide variety of purposes. Material

evidence that dates the purely economic aspect of this exploitation system is lacking beyond about 15 000 years ago. Perhaps the most important use was in the realm of the ceremonial uses about which no detailed discussion is possible because of on-going ritual connotations. This situation has occasionally led to misunderstandings arising between Aboriginal people and those who wish to mine, quarry or cause other major disturbance to granite domes and their surrounds. When clear scientific evidence for use and value cannot be demonstrated, it is difficult to sustain arguments for non-disturbance. It is to be hoped that, dialogue can occur between the many groups within society who have interests in granite domes and their place in the landscape. With a broad understanding of community concerns, an understanding of the complexity of opinions about granite domes can be formulated and appropriate uses determined.

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